Vaccines and Immunizations

Introduction

Immunizations benefit the health of both individuals and the broader community. Individuals are helped because immunizations prevent infectious diseases. Fewer infectious diseases then circulate through communities, decreasing the rates of illness and death. Regrettably, many persons remain unimmunized or under-immunized. In most parts of the world, under-immunization is due to lack of access. In more affluent countries, under-immunization most often results from a lack of comprehension of, or disagreement about, the protection that vaccines provide and how much they are at risk. This leads to either a failure to obtain vaccines on the recommended schedule, or to an outright refusal to vaccinate. Ethical issues regarding vaccines include: the tension between individual rights and community benefit, methods of vaccine development, and vaccine distribution in the event of vaccine scarcity.

A. Biblical

1. We do not own our bodies. All are God's creation (Genesis 1:27). Christians have been bought with a price (1 Corinthians 6:19-20).
2. We have a responsibility to care for our children (Ephesians 6:4, Matthew 7:11).
3. We have a responsibility to care for ourselves (1 Corinthians 3:16-17).
4. We have a responsibility to care for our neighbor (Matthew 22:39).
5. Our neighbor is anyone who comes into our path who needs our care (Luke 10:29-37).
6. Jesus cares about the vulnerable, including children and others who depend on adults to make decisions for them (Luke 18:16). As followers of Christ, we should care for the vulnerable (James 1:27).

B. **Historical:** Immunization milestones:

1. A smallpox vaccine was developed and promoted by Edward Jenner in 1798.[1]
2. A rabies vaccine was developed by Louis Pasteur in 1885.[1]
3. A diphtheria vaccine was developed in 1913, a pertussis vaccine in 1914, and a tetanus vaccine in 1927. They became a combined vaccine in 1948.[1]
4. An influenza (flu) vaccine was first introduced in 1945. [1]
5. The inactivated polio vaccine (Salk) was introduced in 1954 followed by the oral live polio vaccine (Sabin) in 1962.[1]
6. A mumps vaccine became available in 1967, a measles vaccine in 1968, and a rubella vaccine in 1969. They were combined into the MMR in 1971.[1]
7. Smallpox was declared eradicated by the WHO in 1980.[3]
8. Since 1980, vaccines have been introduced to prevent *Hemophilus Influenza* type B, *Streptococcus pneumonia*, Hepatitis A, Hepatitis B, rotavirus, meningococcus, varicella, and others.[1]
9. Rubella was declared to be eliminated from the United States in 2004.[4]
10. Polio is endemic in only a few countries in the world.[5]
11. The success of vaccines is demonstrated by significant decreases in morbidity and mortality of vaccine-preventable illnesses over the past century. (See Appendix A)

C. Medical

1. Immunizations carry a minuscule risk of significant harm to any given individual. Transient fever and pain at the injection site are the most common adverse side effects.[5-7] Very rarely, patients may experience serious reactions, such as fainting (from the injection, not the vaccine), anaphylaxis, or Guillain-Barré syndrome. Any serious reaction should be reported to the United States Vaccination Adverse Effects Reporting System (VAERS).[8]
2. Vaccines are developed for illnesses that result in significant morbidity and mortality. (See Appendix B)
3. Vaccine-preventable illnesses have become less common, significantly reducing disease and death among infants and young children.[5]
4. Vaccine schedules balance early protection with immune response. Most vaccines in early infancy require multiple doses. Some vaccines (e.g. MMR) require a child to reach a certain age before they are effective. Some vaccines require boosters at later times.[9]
5. Alternate schedules that delay vaccination provide no benefit, and leave children at risk for vaccine-preventable disease for a longer period of time.[9,10]
6. A small minority of persons have medical conditions that prevent them from receiving, and thus directly benefiting from, immunization.[9] They can be protected from exposure to the disease, however, if enough of the population is vaccinated to provide herd immunity.
7. Many medical conditions, such as autism, first become evident during the first few years of life, and orthostatic intolerance may become evident in puberty, yet these conditions are unrelated to vaccination. Correlation of timing of disease diagnosis and vaccination does not prove causation by the vaccine.[9-11]
8. No credible scientific study has proved causation of developmental disorders, such as autism, by an immunization product.[9,12]
9. Some diseases require an immunization rate of 90% or greater to protect, by means of herd immunity, those who are unable to be immunized.[13] Thus, the decision to not vaccinate does not affect the individual alone, but may place others in the community at risk.
10. The role of vaccines in public health varies by the nature of the disease targeted. Some vaccine-preventable diseases, such as measles, rubella, and influenza, are easily transmitted and so their vaccines benefit the entire population. Other diseases, such as tetanus and rabies, protect an individual or a small group of people, rather than the entire community. Still other diseases, such as HPV, are related to lifestyle choices, and their vaccines require individualized discussion (See CMDA scientific statement on HPV vaccination).[14]
11. There are occupational, demographic, and international travel reasons for specific vaccinations (e.g., yellow fever, rabies, Japanese encephalitis, dengue fever, and cholera).[14] Consulting an appropriate adviser is recommended.

D. Ethical

1. Vaccine development

a. Abortion is morally reprehensible. (See CMDA statement on Abortion). Several vaccines have been developed with the use of cell strains derived from electively aborted fetuses.[15]
b. Cell strains currently used for some vaccine manufacturing are many cell generations removed from the original abortion done over 50 years ago.[15]
c. In the U.S., (as of 2020) FDA-approved vaccines preventing rubella, varicella, and hepatitis A are produced using fetal cell strains. The adenovirus vaccine also uses fetal cell strains, but it is used infrequently. There are no non-fetal cell strain options in the U.S. for those four vaccines. There are two rabies vaccines, one of which uses fetal cell strains and one which does not.[16]
d. Advocating for the development of vaccines using non-fetal cell strains should be encouraged. Those who consider the use of fetal cell strains as morally problematic can petition manufacturers and the FDA to produce vaccines, both current and future, without these cells.
e. Whether to use current vaccines developed with fetal cell strains is a disputed matter. While undesirable, it may be permissible, or even encouraged, for the following reasons:
    1. One incurs moral responsibility by having a choice. The healthcare professional recommending the vaccine and the patient receiving it did not intend or have any voice in the original immoral act of obtaining fetal tissue, but do intend the beneficial effect of the vaccine.
    2. The time separation from the development of the fetal cell strain and current vaccine may reduce moral complicity. The refusal to use the vaccine will not prevent the original immoral act.[17-19]
    3. The potential benefit from receiving the vaccine may outweigh the past harm. Refusal to be vaccinated because of the original immoral act could cause injury to many persons, most notably children, to whom we have a particular moral obligation to protect from harm.[13,14]
    4. Of note is that no additional fetal tissue is procured for the manufacture of currently used vaccines.[15] The two fetal cell strains used for the rubella, varicella, hepatitis A and adenovirus vaccines came from two abortions, one in 1962 and one in 1970.

f. Continued use of vaccines from fetal cell cultures does not support, require, or justify abortions for future vaccine development or production. Alternatives to fetal cell strains should be developed and used for all future vaccines.[16]

2. Individual Rights and Community Benefit
    a. Adults have an obligation to make decisions in the best interests of their minor children. The person making the decision is often not the person (i.e., the minor child and the child's contacts) who will either benefit or be harmed by that decision.
    b. Adults exercising the right to refuse vaccines for themselves will not be the only person(s) harmed if they transmit a vaccine-preventable illness (e.g., influenza) to unvaccinated individuals in the community.

c. As members of a community, all persons have an obligation to consider the needs of others, themselves, and their families. Individuals who have not received appropriate immunizations (e.g., MMR) should abstain from activities that endanger the vulnerable (e.g., working in the church nursery, caring for unimmunized children, the elderly, or the immunocompromised). People who work with individuals at risk (e.g., HCPs, childcare workers, and teachers), have additional obligations beyond those of the general public to help safeguard the health and well-being of others.
d. Medically eligible persons who refuse vaccination should be encouraged to recognize that they benefit from the vaccination of others via herd immunity. Their immunized neighbors and community contribute to their protection from infectious diseases.
e. Continued monitoring of vaccines for safety and effectiveness is essential for the general public's confidence in current vaccines and the development of new vaccines.

3. Vaccine distribution in the event of scarcity (see CMDA statement on Triage and Resource Allocation).

E. The Role of Society and Government

1. The role of government in immunization is to encourage the protection of all its citizens, including the vulnerable who are at increased risk because of health conditions or age.
2. The right of government to mandate immunizations was established in 1905 by the U.S. Supreme Court in *Jacobson v. Massachusetts*, which held that individual liberty is not an absolute right but is subject to the state's police power in order to protect the health and safety of its people.[20]
3. All states within the U.S. mandate immunizations for school and daycare attendance. All states allow medical exemptions. Some states allow exemptions for religious or philosophical reasons.[21]
4. The Centers for Disease Control and Prevention (CDC) has the responsibility to monitor the safety of vaccines in the U.S.[22]
5. The U.S. government has created the Vaccination Adverse Effects Reporting System (VAERS).[7] The National Vaccine Injury Compensation Program may provide compensation for the rare situation in which an individual may experience a significant adverse response to a vaccination.[23]
6. Government and HCPs are responsible for providing accurate information regarding vaccines and for respectfully countering myths and misinformation that cause fear and vaccine refusal.

F. Vaccine Refusal

1. Many internet sites that claim to educate regarding vaccines have very informative-sounding names but are actually anti-vaccine propaganda and contain erroneous statements.[24]
2. Alternative vaccine schedules that elongate the vaccine administration process leave the patient vulnerable to vaccine-preventable diseases for an extended period of time.

3. Christian HCPs may be aware of vaccine-preventable illnesses present in their church community. To protect the vulnerable, they should make their church leadership aware that such a risk exists, provided there is no breach of patient confidentiality.
4. HCPs should be aware that people who refuse vaccines may travel to areas and countries where vaccine-preventable infectious diseases are common, and may thus place others at risk if they fall ill.
5. An individual's refusal to be vaccinated may have significant negative consequences, such as reduced eligibility for employment, education, or military service.

G. Health Care Professional (HCP) Responsibility

1. HCPs should be familiar with, and communicate freely, the benefits of immunizations.
2. HCPs should seek out and use vaccines produced without the use of fetal cell strains, when possible. HCPs should encourage future development of vaccines without fetal cell strains.
3. The HCP's continued care for patients who refuse vaccines is the ideal. After deliberation, a HCP may make the difficult decision to discharge a patient from the practice. The following should be considered:
    a. The risk to other patients in the practice
    b. The parent or patient's willingness to acknowledge the risks of refusing vaccines, and documentation of the discussion
    c. The parent or patient's willingness to collaborate with other parameters of continued care (e.g. keeping well appointments, reminding staff of immunization status when ill)
4. HCPs should not recommend an alternative vaccination schedule.
5. HCPs should be aware of guidelines for vaccines.

Conclusions

1. Vaccines have significantly reduced the incidence of life-threatening infections and have saved lives.
2. Vaccines are an important part of maintaining health, especially in children.
3. Significant adverse events from vaccines are rare.
4. Vaccines decrease and sometimes eliminate the risk of significant illness and their sequelae.
5. HCPs should advocate for vaccine production that does not use fetal cell strains regardless of their origin. Induced pluripotent stem cells offers a non-controversial source of tissue for culture.
6. HCPs should be aware of the abundance of vaccine misinformation which results in vaccine refusal. This misinformation should be countered with accurate information, patient and respectful discussion, and compassion.
7. HCPs should use their expertise to encourage vaccine usage within their communities and churches.

Policy Considerations

- HCPs should encourage the FDA to facilitate new vaccination development and approval using non-fetal cell strains. These should be fast-tracked.
- HCPS should advocate for the rubella vaccine to be removed from the MMR and offered as a separate vaccine, since it is produced in a fetal cell strain, whereas the measles and mumps vaccines are not.
- HCPs should advocate for rubella vaccine to be made without the use of a fetal cell strain, as it was before 1979, when the current vaccine was licensed.

Bible Verses ESV

Genesis 1:27 So God created man in his own image, in the image of God he created him; male and female he created them.

Matthew 7:11 If you then, who are evil, know how to give good gifts to your children, how much more will your Father who is in heaven give good things to those who ask him!

Matthew 22:39 And a second is like it: You shall love your neighbor as yourself.

Luke 10:29-37 But he, desiring to justify himself, said to Jesus, "And who is my neighbor?" 30 Jesus replied, "A man was going down from Jerusalem to Jericho, and he fell among robbers, who stripped him and beat him and departed, leaving him half dead. 31 Now by chance a priest was going down that road, and when he saw him he passed by on the other side. 32 So likewise a Levite, when he came to the place and saw him, passed by on the other side. 33 But a Samaritan, as he journeyed, came to where he was, and when he saw him, he had compassion. 34 He went to him and bound up his wounds, pouring on oil and wine. Then he set him on his own animal and brought him to an inn and took care of him. 35 And the next day he took out two denarii and gave them to the innkeeper, saying, 'Take care of him, and whatever more you spend, I will repay you when I come back.' 36 Which of these three, do you think, proved to be a neighbor to the man who fell among the robbers?" 37 He said, "The one who showed him mercy." And Jesus said to him, "You go, and do likewise."

Luke 18:16 But Jesus called them to him, saying, "Let the children come to me, and do not hinder them, for to such belongs the kingdom of God.

1 Corinthians 3:16-17 Do you not know that you are God's temple and that God's Spirit dwells in you? 17 If anyone destroys God's temple, God will destroy him. For God's temple is holy, and you are that temple.

1 Corinthians 6:19-20 Or do you not know that your body is a temple of the Holy Spirit within you, whom you have from God? You are not your own, 20 for you were bought with a price. So glorify God in your body.

Ephesians 6:4 Fathers, do not provoke your children to anger, but bring them up in the discipline and instruction of the Lord.

James 1:27 Religion that is pure and undefiled before God the Father is this: to visit orphans and widows in their affliction, and to keep oneself unstained from the world.

References

1. Vincent Iannelli, M. (2020). *Vaccine Timeline and History of Vaccines - VAXOPEDIA*. VAXOPEDIA. Retrieved 10 August 2020, from https://vaxopedia.org/2017/04/19/vaccine-timeline-and-history-of-vaccines/.
2. *Early Tissue and Cell Culture in Vaccine Development | History of Vaccines*. Historyofvaccines.org. (2020). Retrieved 10 August 2020, from https://www.historyofvaccines.org/content/articles/early-tissue-and-cell-culture-vaccine-development.
3. *History of Smallpox | Smallpox | CDC*. Cdc.gov. (2020). Retrieved 10 August 2020, from https://www.cdc.gov/smallpox/history/history.html.
4. *Rubella | Rubella in the United States | CDC*. Cdc.gov. (2020). Retrieved 10 August 2020, from https://www.cdc.gov/rubella/about/in-the-us.html.
5. https://cdc.gov/globalhealth/infographics/pdf/global-impact-of-vaccine.pdf
6. *Vaccine Safety | Vaccine Safety | CDC*. Cdc.gov. (2020). Retrieved 10 August 2020, from https://www.cdc.gov/vaccinesafety/index.html.
7. Tau, N., Yahav, D., & Shepshelovich, D. (2020). Postmarketing Safety of Vaccines Approved by the U.S. Food and Drug Administration. *Annals Of Internal Medicine*. https://doi.org/10.7326/m20-2726
8. https://vaers.hhs.gov/
9. Smith M. (2015). Vaccine safety: medical contraindications, myths, and risk communication. *Pediatrics in review*, *36*(6), 227–238. https://doi.org/10.1542/pir.36-6-227
10. Shetty, V. U., Chaudhuri, P., & Sabella, C. (2019). Rationale for the Immunization Schedule: Why Is It the Way It Is?. *Pediatrics in review*, *40*(1), 26–36. https://doi.org/10.1542/pir.2018-0033
11. Barboi A, Gibbons CH, Axelrod F, et al. Human papillomavirus (HPV) vaccine and autonomic disorders: a position statement from the American Autonomic Society. Clin Auton Res 2020; 30(1): 13-18. doi: 10.1007/s10286-019-00608-w. Epub 2019 Sep 2.
12. *Vaccines Do Not Cause Autism | Concerns | Vaccine Safety | CDC*. Cdc.gov. (2020). Retrieved 11 August 2020, from https://www.cdc.gov/vaccinesafety/concerns/autism.html.
13. *Vaccines: Vac-Gen/Why Immunize?*. Cdc.gov. (2020). Retrieved 11 August 2020, from https://www.cdc.gov/vaccines/vac-gen/why.htm.
14. *Vaccines Protect You and Your Family*. Centers for Disease Control and Prevention. (2020). Retrieved 11 August 2020, from https://www.cdc.gov/vaccines/vac-gen/vaxwithme.html.
15. *Human Cell Strains in Vaccine Development | History of Vaccines*. Historyofvaccines.org. (2020). Retrieved 11 August 2020, from https://www.historyofvaccines.org/index.php/content/articles/human-cell-strains-vaccine-development.
16. *FDA Product Approval: View All*. Immunize.org. (2020). Retrieved 11 August 2020, from https://www.immunize.org/fda/.
17. Agency, M. (2020). *Explainer: Vaccines and aborted human fetal tissue - ERLC*. ERLC. Retrieved 11 August 2020, from https://erlc.com/resource-library/articles/explainer-vaccines-and-aborted-human-fetal-tissue/.
18. *Vatican Statement on Vaccines Derived From Aborted Human Fetuses*. Immunize.org. (2020). Retrieved 11 August 2020, from https://www.immunize.org/talking-about-vaccines/vaticandocument.htm.
19. *Vaccines, Abortion, & Fetal Tissue - Right to Life of Michigan*. Right to Life of Michigan. (2020). Retrieved 11 August 2020, from https://rtl.org/educational-materials/vaccines-abortion/.
20. *Jacobson v. Massachusetts, 197 U.S. 11 (1905)*. Justia Law. (2020). Retrieved 11 August 2020, from https://supreme.justia.com/cases/federal/us/197/11/.
21. *State Vaccination Policies: Requirements and Exemptions for Entering School*. Ncsl.org. (2020). Retrieved 11 August 2020, from https://www.ncsl.org/research/health/state-vaccination-policies-requirements-and-exemptions-for-entering-school.aspx.
22. *Vaccine Safety Monitoring | Ensuring Safety | Vaccine Safety | CDC*. Cdc.gov. (2020). Retrieved 11 August 2020, from https://www.cdc.gov/vaccinesafety/ensuringsafety/monitoring/index.html.

23. *National Vaccine Injury Compensation Program*. Official web site of the U.S. Health Resources & Services Administration. (2020). Retrieved 11 August 2020, from https://www.hrsa.gov/vaccine-compensation/index.html.
24. Hussain, A., Ali, S., Ahmed, M., & Hussain, S. (2018). The Anti-vaccination Movement: A Regression in Modern Medicine. *Cureus*, *10*(7), e2919. https://doi.org/10.7759/cureus.2919

Appendix A: Morbidity and Mortality Before and After the Introduction of Vaccines https://www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/e/impact.pdf

Impact of Vaccines in the 20th & 21st Centuries

Comparison of 20th Century Annual Morbidity & Current Morbidity: Vaccine-Preventable Diseases

Disease	20th Century Annual Morbidity*	2017 Reported Cases†	% Decrease
Smallpox	29,005	0	100%
Diphtheria	21,053	0	100%
Pertussis	200,752	18,975	91%
Tetanus	580	33	94%
Polio (paralytic)	16,316	0	100%
Measles	530,217	120	>99%
Mumps	162,344	6,109	96%
Rubella	47,745	7	>99%
CRS	152	5	97%
Haemophilus influenzae	20,000 (est.)	33§	>99%

* *JAMA*. 2007;298(18):2155-2163

† CDC. *National Notifiable Diseases Surveillance System, 2017 Annual Tables of Infectious Disease Data*. Atlanta, GA. CDC Division of Health Informatics and Surveillance, 2018. Available at: www.cdc.gov/nndss/infectious-tables.html. Accessed on December 3, 2018. NNDSS finalized annual data as of November 28, 2018.

§ *Haemophilus influenzae* type b (Hib) <5 years of age. An additional 10 cases of Hib are estimated to have occurred among the 203 notifications of Hi (<5 years of age) with unknown serotype.

Comparison of Pre-Vaccine Era Estimated Annual Morbidity with Current Estimate: Vaccine-Preventable Diseases

Disease	Pre-Vaccine Era Annual Estimate	2016 Estimate (unless otherwise specified)	% Decrease
Hepatitis A	117,333*	4,000†	97%
Hepatitis B (acute)	66,232*	20,900†	68%
Pneumococcus (invasive)			
All ages	63,067*	30,400¶	52%
<5 years of age	16,069*	1,700¶	89%
Rotavirus (hospitalizations <3 years of age)	62,500‡	30,625§	51%
Varicella	4,085,120*	102,128††	98%

* *JAMA*. 2007;298(18):2155-2163

† CDC. Viral Hepatitis Surveillance – United States, 2016

¶ CDC. Unpublished. Active Bacterial Core surveillance. 2016

‡ CDC. *MMWR*. February 6, 2009 / 58(RR02); 1-25

§ New Vaccine Surveillance Network 2017 data (unpublished); U.S. rotavirus disease now has biennial pattern

†† CDC. Varicella Program 2017 data (unpublished)

Appendix B: Disease Complications
Pinkbook | Home | Epidemiology of Vaccine Preventable Diseases | CDC. Cdc.gov. (2020). Retrieved 11 August 2020, from https://www.cdc.gov/vaccines/pubs/pinkbook/index.html.

- *Measles*
    1. 30% of patients have complications, most commonly in those under 5 years of age or over 20 years of age
    2. Diarrhea 8%
    3. Otitis media 7%
    4. Pneumonia 6% The most common cause of death
    5. Encephalitis 0.1% Resulting in death in 15% and neurologic damage in 25% of these patients
    6. Seizures 0.6-0.7%
    7. Death 0.2%
- *Mumps*
    1. Orchitis in 12-66% in post-pubertal males with infrequent infertility
    2. Pancreatitis 3.5%
    3. Symptomatic aseptic meningitis
    4. Transient and permanent unilateral deafness 1 per 20,000
    5. Death 2 per 10,000
- *Pertussis*
    1. Secondary bacterial pneumonia
    2. Approximately half of infants are hospitalized
    3. Majority of deaths occur under 3 months of age
    4. Seizures and encephalopathy can occur, primarily in young infants
- *Influenza*
    1. Death usually less than 0.1%
    2. Pneumonia
    3. Myocarditis

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